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SUBSTITUTES FOR LEAD IN JOINTS[1]

BY THOMAS HEALY[2]

At the Council Bluffs meeting of the Iowa Section a paper was read[3] regarding a material used by the Omaha water works in the place of lead for making joints in water mains. Afterwards, by courtesy of Mr. Howell, a visit was made to Omaha where an opportunity was given to see some joints poured with metalium and observe the result of turning the water pressure immediately thereafter on the mains having these joints. The advantage of metalium joints seemed to be that the material was cheaper per joint than lead. Not so much fuel was needed to melt it as was needed to melt lead. The bell holes required were not so large and no calking was needed. The disadvantage seemed to be at the time that greater care was necessary to melt metalium than lead because if too cold it would not pour and if too hot it became stiff and might burn.

No way by which a joint which leaked could be made tight was apparent and the author did not have the nerve to act on the advice of the users, who said that if it was left alone the leak would stop of itself. The author had no previous acquaintance with that kind of a leak. Finally, as the war went on, the cost of lead went up, and the Government continued to request that metals should not be used, the Davenport Water Company decided to try out metalium for joints in some mains it was laying for the U. S. Housing Corporation. This corporation was building several hundred houses to help relieve the situation caused by bringing several thousand additional families to Davenport, Rock Island and Moline, to help turn out material of war at the Government Arsenal situated at this point. These mains were required at once, and it was found possible to lay them more quickly when no calking was required.

In using metalium in Davenport it is customary to join three or four lengths of pipe before lowering them into the trench. The pipe are laid on sticks across the ditch, lined up and leveled, and, after pouring the joints, are lowered by two pipe derricks using rope slings. No trouble seemed to result from handling the pipe after the joints were poured. The metalium joint takes a little longer to cool than lead, especially the gate, which is made large to insure filling the joint.

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[1] Read before the Iowa Section, April 16, 1919.

[2] With Davenport Water Company, Davenport, Iowa.

[3] JOURNAL, AMERICAN WATER WORKS ASSOCIATION, June 1918; page 174.

The Davenport Water Company started out cautiously in this work. It used the special furnace furnished by the metalium manufacturers and all the tools they have developed. The manufacturers agreed to send an expert to oversee the pouring of the first joints, but the work was started before he arrived and his only help lay in saying the work was done well. Some of the pipe to be laid was 12-inch and lead was used for this size. The first line using metalium was 6-inch pipe and this line was bottle-tight when tested. The next 6-inch pipe laid developed two or three leaks and it was decided that these leaks were due to carelessness, for the pouring seemed so easy the men neglected to clean the pipe in the joints or to make the gates high enough to insure a full joint. As soon, however, as the men became as careful as at first there was no further trouble.

Nine or ten pounds of lead are usually employed at Davenport in pouring a 6-inch joint and it was found that 3 pounds of metalium would make a joint of the same size. At that time lead was 8 cents and metalium 10 cents per pound so the material in the joint cost us about three-eighths as much as lead would have cost. Lead, however, is much cheaper now than it was at that time.

When using lead a kerosene oil furnace is employed which requires about 25 gallons of oil to keep it going all day. The number of joints poured in a day varies widely, so the cost of oil varies, as it is not practical to let the lead furnace cool off but the flame is kept going whether little or much lead is melted. With the furnace used for metalium only wood is needed and it is possible to "borrow" a piece here and there, which furnishes the small quantity required.

It is evident that, there being no work to do in the bell hole except to put on and take off the jointer, very little space is required. At first jointers were used up rather rapidly and probably more jointers are needed than are required for lead. However, by soaking the jointer in water and smearing it with clay, it lasts longer than formerly.

Metalium is easy to handle and there has been no trouble in having orders filled promptly. In one or two instances old joints that have caused trouble by lead blowing out have been poured with metalium and these joints hold well so far.

In 1918, the company laid 9,155 feet of pipe with metalium joints and so far it has laid nearly as much in 1919, and expects to continue to use it until something better develops.

In 1917, the company laid 424 feet of 6-inch pipe with leadite joints and this has given no trouble of any kind since laying. The methods and cost of using leadite were not very different from those in the case of metalium.